Claims

1.   A method of testing functionality of an image display device that comprises a matrix of image elements that are individually energisable in a graphical display, the method comprising capturing data corresponding to first and second images of the display provided by the device under different test conditions thereof, and utilising the image data for the first and second images to identify a malfunction of the device.

2.   A method according to claim 1 including energising and de-energising the elements individually to produce the data corresponding to the first and second images such that elements energised for the first image data capture are de-energised for capturing the second image data.

3.   A method according to claim 1 including capturing data corresponding to the first image when all of the image elements are energised and capturing data corresponding to the second image when none of the image elements are energised.

4.   A method according to claim 1 including capturing data corresponding to the first and second images when alternate ones of the matrix of image elements are energised and de-energised and such that elements energised for the first image data capture are de-energised for capturing the second image data.

5.   A method according to claim 1 wherein the utilising of the image data includes comparing the image data for the first and second images to derive resultant data corresponding to the functionality of the elements individually.

6.   A method according to claim 5 wherein the elements are configured in an array of rows and columns, and including combining the resultant data for at least a part an individual one of the rows or columns, and comparing the

combined data with a threshold to provide an indication of a malfunction in the device.

7.   A method according to claim 6 wherein the value of the threshold is determined as a function of the resultant data.

8.   A method according to claim 6 wherein the threshold is a weighted combination of the mean and standard deviation of the values of the resultant data included within the individual row or column.

9.   A method according to claim 1 including capturing the image data with an electronic camera.

10.   A method according to claim 1 wherein the display device comprises a liquid crystal display device.

11.   A method according to any preceding claim wherein the display device is mounted in an electronic apparatus with a back light operable to illuminate the display device, including capturing the data corresponding to the first and second images with the back light in use.

12.   Apparatus for testing functionality of an image display device that comprises a matrix of image elements that are individually energisable in a graphical display, the apparatus comprising an optical image capture device configured to capture data corresponding to first and second images of the display provided by the device under different test conditions thereof, and a processor configured to utilise the image data for the first and second images to identify a malfunction of the device.

13.   Apparatus according to claim 12 including a test pattern generator configured to provide first and second electrical test patterns for energising the matrix of image elements to produce said first and second images.

14. Apparatus according to claim 13 wherein the test pattern generator is configured to energise and de-energise the elements individually produce the data corresponding to the first and second images.

15. Apparatus according to claim 13 wherein the test pattern generator is configured to energise all of the elements for the first image and to energise none of the elements for the second image.

16. Apparatus according to claim 13 wherein the test pattern generator is configured to energise and de-energise alternate ones of the matrix of image elements such that elements energised for the first image data capture are de-energised for capturing the second image data.

17. Apparatus according to claim 12 wherein the processor is configured to compare the image data for the first and second images to provide resultant data corresponding to the functionality of the elements individually.

18. Apparatus according to claim 17 wherein the elements are configured in an array of rows and columns, and the processor is configured to combine the resultant data for at least a part of an individual one of the rows or columns, and to compare the combined data with a threshold to provide an indication of a malfunction in the device.

19. Apparatus according to claim 18 wherein the processor is operable to determine the value of the threshold as a function of the resultant data.

20. Apparatus according to claim 19 wherein the threshold is a weighted combination of the mean and standard deviation of the values of the malfunction data included within the individual row or column.

21. Apparatus according to claim 12 including an electronic camera for capturing the image data.

22.   A computer program to be run on the processor in apparatus as claimed in claim 12, the program being operable to cause the image data for the first and second images to be compared so as to identify a malfunction of the device.

5   23.   A program according to claim 22 configured to cause the processor to compare the image data for the first and second images so as to provide resultant data corresponding to malfunctions occurring individually in an array of regions of the device configured in rows and columns, to combine the resultant data for at least part of an individual one of the rows or

10   columns, and to compare the combined data with a threshold to provide an indication of a malfunction in the device.